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THE ORIGINS AND IMPACT OF
MEDICAID REIMBURSEMENT AND ELIGIBILITY
POLICIES ON PHYSICIAN PARTICIPATION

Final Report

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by

Jerry Cromwell, Ph.D.
Janet B. Mitchell, Ph.D.

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ABSTRACT

States vary in both the scope of coverage and the rates paid providers of Medicaid services which, in turn, affects both physician participation and program outlays. Two theoretical models are developed and tested: one, a dual market demand model showing how Medicaid competes with private insurers for scarce physician time; the other, a voter-taxpayer utility model explaining state tradeoffs in Medicaid eligibility/service coverage and payment generosity to participating physicians. Multivariate regression of a recursive path model is used to estimate both models, using the 1977-78 HCFA/NORC physician surveys, supplemented by Census and Medicaid program characteristics.

The principal finding of the study is that states do vary systematically in their generosity to providers and potential eligibles, and that this has a direct impact on Medicaid access to primary care and the maldistribution of patients. Eligible and provider generosity both encourage physician participation although only the former is associated with a greater likelihood of a Medicaid eligible being treated in a large Medicaid practice; greater physician generosity does not appear to exacerbate inequalities as new participants offset the positive incentive to run Medicaid-dominated practices. States using outside agents for claims processing are more likely to get physicians to participate, holding fee generosity constant, which may be attributable to faster processing and less paperwork.

Use of limited Medicare or fixed fee reimbursement modes reduce program generosity (defined as the ratio of the average Medicaid to the physician's usual fee) by about the same 4 percentage points, ceteris paribus, implying that alternative reimbursement approaches do indeed make programs more stringent. Holding state income and reimbursement mode constant, higher federal matching shares (FMAP) result in more physician generosity with states essentially passing through at least part of the cost sharing to providers. No similar pass-throughs were found for eligible generosity; in fact, just the opposite, high FMAP states were consistently less generous in eligibility/service coverage even after state wealth and other factors were held constant. States enjoying heavy federal matching apparently have not chosen to demonstrably expand Medicaid coverage but rather have used the "savings," implicitly, to fund other programs or keep tax rates low.

Offering a medically needy program was positively related to eligible generosity: every medically needy optional service raised Medicaid recipients per poor person 1.1 points, or 18.7 points (around a mean of 47%) between the most generous states and those without such a program. Furthermore, states with greater shares of AFDC in total recipients appear more generous to the poor. As AFDC utilization rates per eligible are much lower than those of SSI eligibles, this finding must be attributable to much higher fractions of the poor being determined Medicaid-eligible. Services offered the categorically eligible did not affect overall eligible generosity, from which it is concluded that what really distinguishes Medicaid programs is not the depth of service coverage as much as the breadth of eligibility coverage.

Finally, states in the four regions do exhibit definite programmatic "styles" in controlling expenditures. North Eastern states, in setting Medicaid fees, are somewhat less generous to physicians and much more generous to the poor in terms of coverage than elsewhere, even after adjusting for their higher tax base. Western programs, by contrast, are more generous than average to both providers and the poor although nowhere near as much to the poor as in the North East. Southern programs, by contrast, more often use generous Medicare reimbursement principles and offer many fewer optional services to the categorically eligible.

THE ORIGINS AND IMPACT OF MEDICAID
REIMBURSEMENT AND ELIGIBILITY POLICIES ON PHYSICIAN PARTICIPATION

1.0 Introduction

One of the major goals of the Medicaid program has been the integration of the poor into mainstream medicine. To this end, an insurance scheme was devised that allowed Medicaid eligibles the discretion to choose among hospitals, physicians, and other providers. Provider participation -- particularly among physicians -- was strictly voluntary so long as they were willing to accept the Medicaid allowed charge as payment in full.

Whether the program has been a success, therefore, depends in no small way on how physicians have responded to the fee schedules and accompanying rules and regulations regarding payment. Distressing in this regard is the anecdotal evidence of serious fraud and abuse of the system by physicians, especially in practices concentrating on the Medicaid population (U.S. Senate Committee on Finance, 1970). While Large Medicaid Practices (or LMPs) are not necessarily "mills," the maldistribution of Medicaid patients is a legitimate concern. If the majority of the poor are being relegated to a few physicians, both their access to office-based care and the quality of care they receive may be jeopardized. For example, several studies have shown that physicians with large Medicaid caseloads are older (Kavaler, 1969), general practitioners (Sloan, Cromwell, Mitchell, 1978; Jones and Hamburger, 1976), lacking in hospital affiliations (Kavaler, 1969; Bloom, et al., 1968), and trained abroad (Studnicki, 1976; Sloan, Cromwell, Mitchell, 1978).

Because LMP physicians are generally less credentialed, serious consideration must be given to changes in program policy that might exacerbate the distribution even further. We already know that physicians are more likely to participate in Medicaid when fees are higher (Sloan, Cromwell, Mitchell, 1978), but participants also expand their Medicaid caseloads when enticed by higher fees, leaving unclear the ultimate impact of fees on maldistribution. Policymakers have voiced concern over raising fees for fear that Medicaid mills will reap most of the benefit (Bellin and Kavaler, 1971). Whether these fears are well founded remains an empirical question to be addressed in this paper.

Also of concern is program scope and patient maldistribution. In states with large numbers of Medicaid eligibles relative to office-based physicians, will the maldistribution problem be more acute, or will more physicians choose to participate and keep LMP growth within bounds?



Possibly of even greater policy significance are the factors determining how broad a coverage is extended to the poor and disabled. Why do some states fail to adopt a medically needy option, restrict services to categorical eligibles, and/or reimburse physicians on a fixed fee basis? Are there discernible patterns in the way states attempt to deal with the Medicaid fiscal crisis, some cutting back on service coverage while others tighten reimbursement procedures?

Answers to these and other questions require two models: one of physician participation in Medicaid that simultaneously deals with non-, small, and large participants; another of states' Medicaid policies pertaining to reimbursement and eligibility. The next section first lays out an economic theory of the size distribution of Medicaid practices taking into consideration: (a) competition from private markets and other physicians; (b) eligibility limits; (c) discrimination; and (d) factors affecting physician supplies. It then goes on to explain variations in Medicaid program structure. This is followed by a brief discussion of data sources and an empirical test of the model. The last section provides an interpretation of the findings in terms of Medicaid programmatic styles.

2.0 Theory

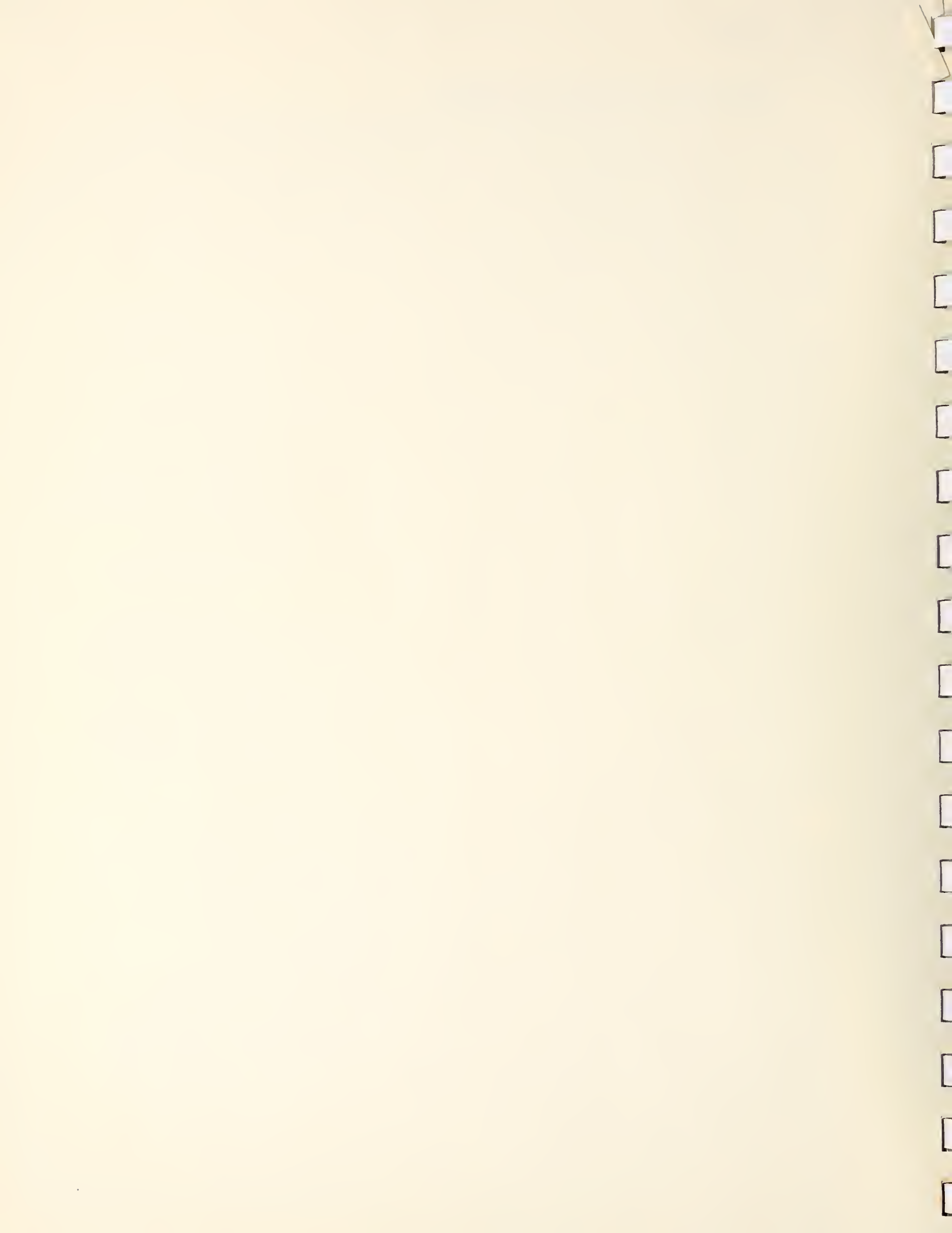
2.1 Physician Participation in Medicaid

The origins of large Medicaid practices can be considered in terms of a two-market demand model.¹ In one market, the physician is a price-setter; demand is downward-sloping and additional visits are demanded only at lower prices. In the second market, fees are predetermined and the physician serving this market can provide as much as he chooses, within limits, at a fixed price. While several insurers have fixed payment schedules, we consider only the fixed payment Medicaid program here.

Assuming profit maximization (to be relaxed momentarily) for each visit level, the physician moves down along his marginal revenue curve, AB, in Figure 1 until marginal revenue falls below the fixed Medicaid fee, f_m .² The physician would then begin to participate in the Medicaid program until the pool of Medicaid patients were exhausted.³ Demand segment, BC, corresponds to the potential pool of Medicaid patients upon which each physician may draw. The introduction of Medicaid effectively segments marginal revenue into two parts: one above, one below, the Medicaid fee, f_m . Marginal patients in the upper segment, AB, are willing and able to pay higher fees than f_m , while in segment CD, they will only pay less than f_m .

If a physician's supply curve were S_3 he could be said to be operating a Small Medicaid Practice (SMP) as the majority of his visits are with private patients. (A more precise definition of an SMP will be given later.) If physician supply were further to the right, say S_4 , then this practice could be considered an LMP, as a majority of patient visits are devoted to Medicaid patients. If supply were far to the left, say S_1 , then the physician would not be accepting any Medicaid patients.

Thus, the physician's decision to participate in Medicaid, as well as the level of his participation, will depend on supply and private-plus-Medicaid demand. Private physician demand can be considered a function of patient (a) health status; (b) income; (c) insurance; (d) physician credentials; and (e) competition. Considerable empirical research has documented the effects of health status, income, and insurance on private demand (Feldstein, 1970; Newhouse and Phelps, 1976). Patients should also be willing to pay higher fees to see better trained specialists. Holding these factors constant, private demand per physician should be lower in physician-rich areas because of competition, with limited numbers of patients spread among a larger number of physicians.⁴ Factors limiting private demand shift marginal revenue inward (see A'B', in Figure 1), increasing the Medicaid participation rate for a given physician, ceteris paribus. Reduced demand would also draw into the program marginal nonparticipants (represented by supply S_2).



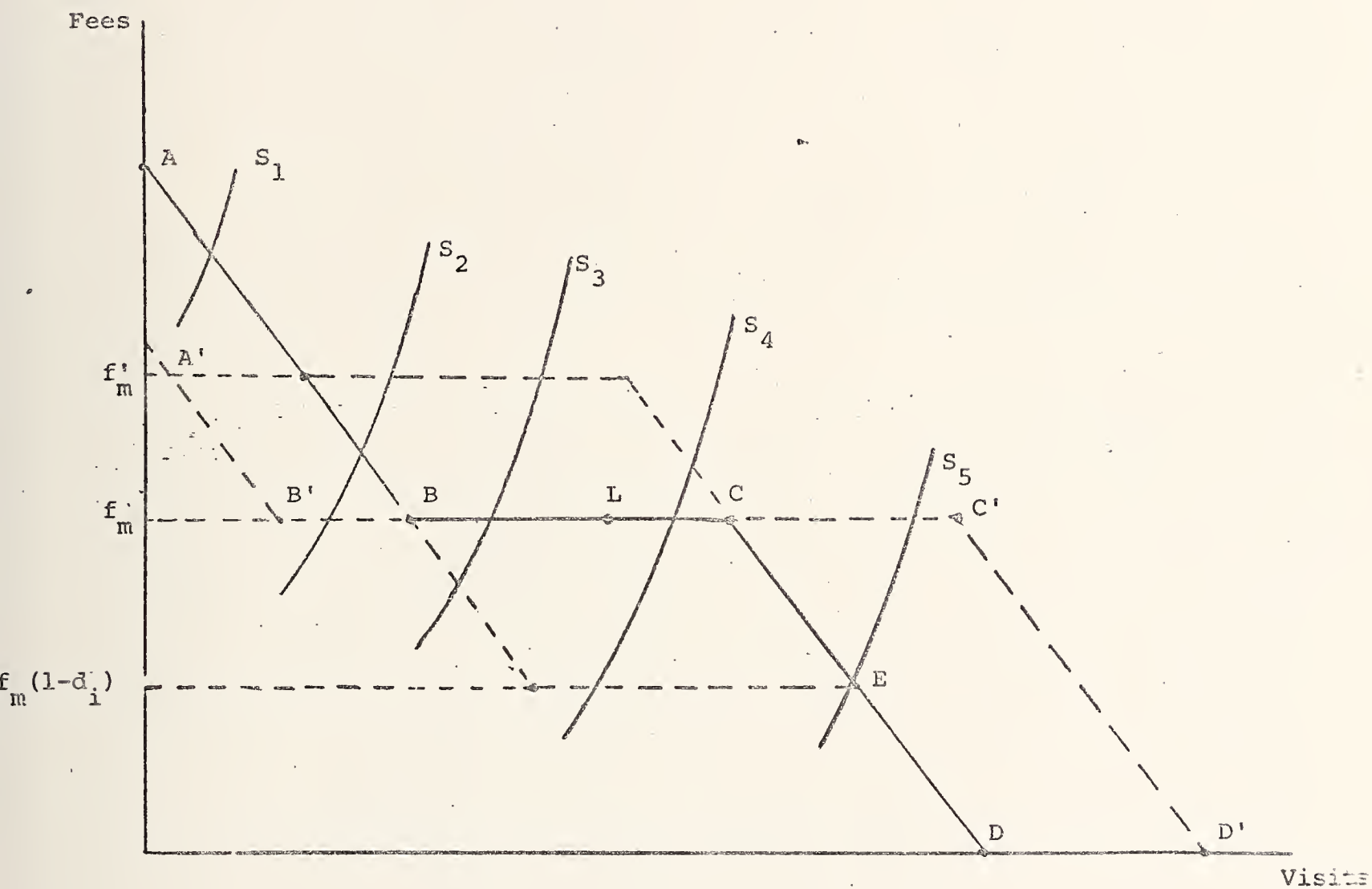


FIGURE 1: Medicaid Participation Model

2.1.1 Medicaid Coverage and Generosity

Medicaid coverage and generosity of payment will definitely affect the level and nature of physician participation. Consider first an increase in Medicaid fees from f_m to f'_m without a change in program eligibility. If physician supply were S_2 , an increase in fees to f'_m would draw the physician into the Medicaid market as an SMP. If supply were S_3 , the effect of a Medicaid fee increase could be to turn an SMP into an LMP. Note that while total visits have increased with higher Medicaid fees, private visits have generally decreased, implying some substitution of poorer Medicaid for wealthier (or previously better insured) patients at the margin. Physicians with supply S_1 and S_5 would be unaffected by the fee increase; the former still not seeing any Medicaid patients while the latter sees all that ask for an appointment.

The net effect of Medicaid fees on the probability distribution of SMPs and LMPs in an area is generally ambiguous. Higher Medicaid fees do not necessarily foster LMPs (at least as a percent of participants) if significant numbers of new physicians (like S_2) enter the Medicaid market as SMPs.

An increase in program eligibility or scope of benefits should have different effects. Increasing the Medicaid-eligible pool per physician has the effect of "lengthening" the Medicaid line from BC to BC'. This should have no effect on nonparticipating physicians: Medicaid fees have not increased, so marginal revenues from private patients still exceed the Medicaid fee.⁵ Nor would it have any effect on participating practices that have not exhausted their potential pool of eligibles, again for the same reasons. Some practices, however, may be seeing all the Medicaid patients who apply and some non-Medicaid poor in addition, e.g., S_5 . An extension of Medicaid coverage would have a positive effect on participation (as well as on total visits) as these physicians substitute better paying Medicaid for poorer paying private patients. If Medicaid-extended coverage were for the poor who were already part of the physician's caseload, say, CE, then no substantial improvement in access would obtain; only a reduced out-of-pocket burden for the new eligibles (unless S_5 were quite elastic). If coverage were extended to patients in segment ED, however, then the near poor comprising CE would suffer as a result of expanded Medicaid coverage to the very poor.

A practice characterized by S_5 highlights an interesting point. A physician may be seeing all the Medicaid patients that apply, but because the eligible population is so limited (at least before the program expanded), his practice may still be an SMP. Furthermore, the length of the horizontal line,

which is based on the Medicaid population, is clearly related to private demand factors such as income. For this reason, we would expect both participation rates and the number of LMPs to be higher in poorer neighborhoods, inner cities, and rural areas. This may be offset, on the other hand, by a shortage of physicians in these areas which would shift out pro rata private demand and reduce Medicaid participation. Thus we have the rather surprising conclusion that the number of both nonparticipants and LMPs in a low-income, high Medicaid area may be higher than elsewhere if physicians are particularly scarce -- as they generally are in these areas.

Summarizing on the demand side, the theory predicts that any factor raising (lowering) private demand per physician (e.g., income, insurance, health status, credentials and specialization, the physician/population ratio) should decrease (increase) the probability of participation as an SMP and of the participating practice expanding to an LMP, ceteris paribus. Similar predictions obtain for an increase in Medicaid fees. Whether higher Medicaid fees would exacerbate the distribution of patients between SMPs and LMPs becomes strictly an empirical question. Extensions in program eligibility, by contrast, should have definite effects on the size distribution of Medicaid practices, essentially skewing the distribution towards more LMPs.

2.1.2 Discrimination

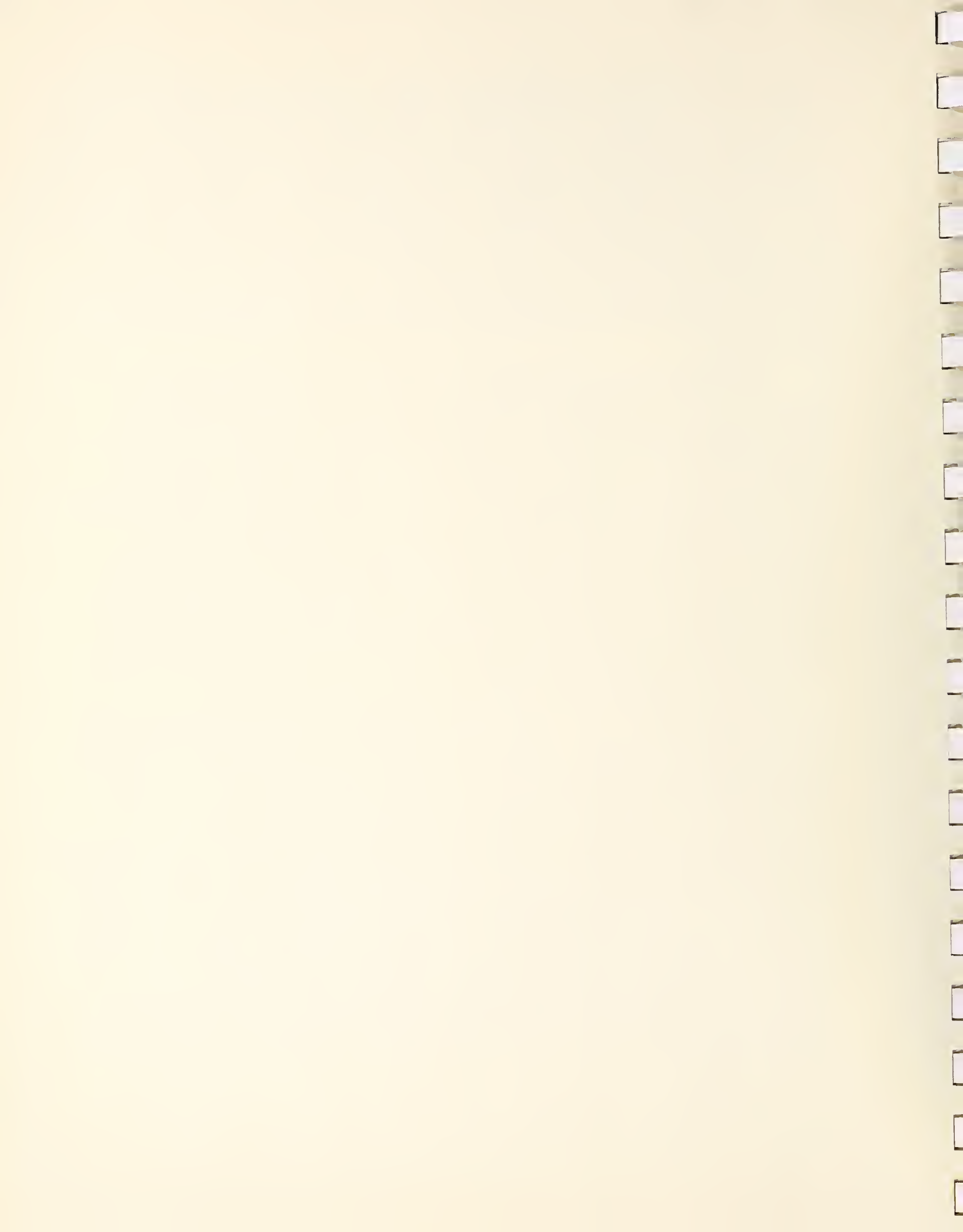
The analysis so far has implicitly assumed physicians do not discriminate among patients on factors other than ability to pay. Some physicians, however, may have a distaste for Medicaid patients or the program as a whole. Some of their reasons may be objective (e.g., fee schedules too low, long payment delays, too much red tape, few Medicaid eligibles), others more personal. In a 1976 physician survey, nearly 40 percent of nonparticipants cited an "opposition to government in medicine" as a very important reason for not participating in the Medicaid program. Twenty-five percent also cited a "dislike for the kinds of patients enrolled" as a reason for not participating (Sloan, Cromwell, Mitchell, 1978). Subjective responses like these strongly suggest that physicians discriminate against Medicaid patients for other than economic reasons.

Faced with a stated Medicaid fee, f_m , some physicians act as if $f_m(1-d_i)$ were the net fee, where d_i reflects the strength of the i -th physician's discrimination coefficient à la Becker (1957).⁶ This has the effect of lowering the flat Medicaid portion by an amount, $f_m d_i$, which will clearly vary by individual physician, unlike f_m which all physicians receive as a nominal

payment.⁷ The effect of discrimination will be to lower participation and physician gross revenues, but not always. For example, it is immaterial whether physician with supply S_1 is a discriminator or not, for he would not participate in Medicaid in any event. For physicians with supply S_3 or S_4 , however, discrimination does make a difference. The "potential" SMP physician with supply S_3 , if he had a positive discrimination coefficient, d_1 , would not participate in Medicaid, even though he ought to on objective financial grounds. The "potential" LMP physician with supply S_4 would only be an SMP, choosing instead to move further down his private demand curve before (begrudgingly) entering the program.

Discrimination in this context would cost the physician because he chooses to see poorer-paying private patients at the margin rather than better-paying Medicaid patients. Economic losses to physicians naturally increase with d_1 .⁸ In the extreme where $d_1 > 1$, the physician would limit himself strictly to non-Medicaid patients no matter what his objective supply is. For these physicians the economic loss could be a high price to pay for refusing to accept Medicaid patients, particularly if private demand were limited. This does not necessarily mean that the physician is not seeing poor patients. On the contrary, he may be seeing many of the poor. He is just not receiving directly from them as much as he could if he had chosen to accept them as Medicaid patients.

The size distribution of Medicaid practices will vary depending on the mean and variation in d_1 . Holding other factors like private demand and the distribution of practices constant, an inverse correlation between discriminatory preferences and supply (i.e., smaller suppliers with a greater distaste for the Medicaid program) should result in greater inequalities in Medicaid practice size. In this case, there should be more nonparticipants and fewer SMPs, leaving the bulk of the Medicaid population to be served by a few LMPs. A greater average level of discrimination in an area, like Medicaid fees, has an ambiguous effect on SMP/LMP inequalities, while a positive correlation between discriminatory preferences and private demand would reinforce both as discriminators enjoy a more lucrative private practice, leaving nondiscriminators lacking wealthy private patients to treat the Medicaid population.



2.1.3 Variations in Physician Supply

The ultimate impact of any shift in private or Medicaid demand on Medicaid participation rates in an area will depend on the locus and distribution of supply. Medicaid patients constitute 10-15 percent of all private physician caseloads nationwide. If Medicaid patients and physicians were distributed equally across the general population, then participation rates should approximate 10-15 percent in any community. Because neither is very equally distributed, it is possible for all physicians in an area to be operating LMPs if few non-Medicaid patients exist. They would not have to be; need may simply go unmet as physicians choose to see a limited number of patients in toto.

If supply was uniformly distributed along the entire "visits" axis as shown (roughly) in Figure 1, then a complete mix of nonparticipants, SMPs, and LMPs would obtain. Shifts in demand would alter the mix, with increases in private demand (or reductions in Medicaid fees) resulting in more nonparticipants, fewer LMPs, and more or less SMPs, depending upon the distribution of practices around the "drop-out" kink (B) and some designated point L, the point where an SMP becomes an LMP.⁹ If practices are more closely bunched around B than L, then increases in private demand or Medicaid fee reductions should reduce the relative number of SMPs to LMPs and exacerbate inequalities in the distribution of Medicaid patients across physicians.

The locus and distribution of area supply will depend on the mean of, and the variance in, the characteristics that underly individual physician supply: input prices; productivity; physician preferences for income and leisure; and practice style. In areas where auxiliary wages are high, or where average productivity is low, total physician supply will be lower as physicians are financially limited in the visits they can provide profitably for a given fee. Specialists, for example, see fewer patients per hour. Therefore, in specialist-dominated areas, we would expect more limited supply and lower participation rates, ceteris paribus. If physicians in an area also have a higher average preference for leisure (e.g., older, semi-retired physicians in Florida or Arizona), supply would be less than in areas where work (or income) preferences were stronger. Finally, in areas served by physicians whose practice style included a significant number of high quality inputs, amenities, and the like, supply would also be less as fees would cover only a limited number of more costly visits before marginal costs exceeded marginal revenues.

Variations in physician supply would be a function of variations in the same four categories. Presumably all practices in an area would face the same non-physician input prices although certain exceptions may exist (e.g., black physicians may have to pay higher wages to attract white RNs in urban ghettos); thus, within-area variations in factor prices should not be a major contributor to supply differences or to the number of LMPs, although they may explain more of the inter-area variation.

Variations in physician productivity are considerable, however, as Reinhardt (1975) has shown. Much of this variation tends to be specialty-specific.¹⁰ What output variation remains would depend to a large extent on the physician's managerial capacities and inclinations.

Physicians also vary considerably in the imputed wage they apply to their own efforts or, alternatively, their preferences for leisure. In addition to random variations in income-leisure preferences, physicians with significant non-practice income, or who are elderly, or female physicians who have children they are responsible for raising, should have a greater disutility for work, ceteris paribus (Sloan, 1974, 1975; Sloan, Mitchell and Cromwell, 1973).

Finally, and most important from a policy perspective, physicians vary in their choice of practice style, partly out of training and specialty choice, partly out of a desire to increase incomes. Variations in practice style include the time physicians spend with patients, the ancillaries they order, the quantity and quality of labor inputs used, the size of waiting rooms, and the like.

Consider first the use of ancillaries. As they are usually billed separately, it is appropriate to consider ancillaries a second output of the physician's practice, complementing direct patient contacts. Physicians may or may not internalize ancillary services.¹¹ If they do not, no financial benefit would derive from ordering tests and procedures unless illicit kickbacks were being paid. Where physicians do produce ancillaries in their offices, they have a direct financial interest in the allowed charges of third party payors and in production costs. For each visit, physicians would receive two fees, one for the visit itself plus a second for any ancillaries, resulting in a total visit price. The effect of internalizing ancillaries is to shift final visit demand outwards, resulting in

more private visits being provided (assuming positively sloped supply curves). The marginal physician internalizing ancillaries would have less of a need or desire to enter the Medicaid market as marginal revenues per private visit are higher. Physicians with very strong income preferences, however, may feel freer to order additional tests for their Medicaid patients who incur no out-of-pocket cost, a behavior typifying Medicaid mills (Moss, 1979). For these physicians, the decision to internalize ancillaries and to see large numbers of Medicaid patients would be jointly determined.

Other differences in practice style such as time spent with patients, use of support personnel, and amenities, can be characterized as supply shifts. Physicians who see patients on an assembly-line basis, and who skimp on needed auxiliary personnel can certainly see more patients per hour at lower incurred costs. The higher net incomes enjoyed, however, come primarily at the patients' expense and would not be condoned by the majority of medical professionals. It is difficult in practice, however, to discriminate between the true quality minimizer and the more efficient practitioner.

2.2 Medicaid Eligibility and Reimbursement Policies

State Medicaid policy regarding generosity to physicians and coverage of the poor and medically needy is not random, but rather varies systematically in ways demonstrated by Sloan (1979) and Davidson (1980). Using a voter-taxpayer utility maximization model with disposable income, services per poor person, and a vector of exogenous income-service preferences as arguments, Sloan (1979) derives testable hypotheses regarding Medicaid fee generosity (viz., the percent of the physician's usual charge reimbursed by Medicaid). The greater the percentage of program expense reimbursed by the federal government (FMAP), and the greater the number of taxpayers or per capita income in the state, the greater should be program generosity. Greater numbers of poor people, on the other hand, should constrain generosity, holding FMAP constant, as taxpayers seek to protect after-tax incomes. (This is the main reason, in fact, why Congress adopted a sliding matching scale based on state per capita income.) Physician characteristics that affect usual fees and relative generosity include specialty, board certification, age, and foreign medical training.

Two program structure variables also are hypothesized to influence generosity: reimbursement method and locus of Medicaid rate-setting. While states use a variety of payment methods, they can be collapsed to three: a Medicare UCR system, a UCR system with more stringent limits, or some type of fixed fee schedule. Generosity should vary inversely across modes with fee schedules being the least generous. Second, Medicaid agencies are located in a variety of settings including health departments, welfare departments, or umbrella and special agencies. Health departments may be more institution-oriented, and hence less generous to physicians, but this is certainly conjectural.

Other socio-demographic factors include the percent of the population living in metro areas or nonwhite. A higher proportion of the population in urban areas may act as an additional income, or wealth, proxy and thus be positively related to generosity. It may also have implications for access to providers. More blacks, percentagewise, may spawn less generous programs, on the other hand, assuming political dominance of white majorities in state legislatures.

FMAP, other taxpayer income characteristics, and physician characteristics would all be expected to have similar effects on Medicaid coverage as well as generosity. A larger poverty population, by contrast, should discourage a broader eligibility base more than curtailing physician reimbursement. Reimbursement mode should have no real effect on coverage, but where the Medicaid agency is located may have an effect. Welfare-oriented agencies, for example, may be more inclined to broaden coverage than those more influenced by providers.

We may observe two contrasting Medicaid styles in maximizing voter-taxpayer utility. One chooses to narrowly define eligibility and provide greater access and physician generosity to those that are deemed eligible, while a second allows broad eligibility but is less generous in services covered and to physicians. Whether the locus of the agency, the size of the poverty and black population, and the region of the country will discriminate between these styles will be empirically determined.

3.0 Data Sources

The primary data base for this analysis is the 1977-78 physician surveys conducted by the National Opinion Research Center (NORC) for the Health Care Financing Administration (HCFA). These surveys were a nationally representative sample of 8,347 physicians in fifteen specialties. The sample was then reduced to approximately 4,700 physicians in the five primary care specialties: general practitioners, general surgeons, OB-GYNs, pediatricians, and internists. All physicians were in office-based, private practice. Group practices with nine or more physicians were excluded.

An extensive questionnaire was administered to all physicians covering practice costs, work effort, size and type of practice, physician income, and fees. All information was based on physician self-reports. The size distribution of Medicaid practices was calculated from the individual physician's response to the following question: "About what percentage of your patients have Medicaid?"

Measurement error may be present if physicians refused to participate in the survey, or if they reported inaccurate or incomplete information during the interview. Analysis of the 1976 physician survey found that non-respondent physicians did not differ from cooperating physicians along characteristics believed to be associated with large Medicaid practices, such as specialty, board-certification, and FMG status. Weights associated with the samples include adjustments for nonresponse.

Five additional data sources were merged with the physician survey for this analysis. Biographic information on individual survey physicians was obtained from the AMA Masterfile, including such data as physician age, board-certification, and medical school. Variables describing the physician's county, such as demographic characteristics, were drawn from the Area Resource File, while statewide variables were taken directly from the 1978 Statistical Abstract. Two community variables, per capita income and physician-population ratios, were obtained from a more current source: the AMA's Physician Distribution and Medical Licensure in the U.S., 1976. Finally, Medicaid programmatic information (e.g., locus of Medicaid administration, FMAP) was abstracted from the 1979 edition of the MMMI's Data on the Medicaid Program.

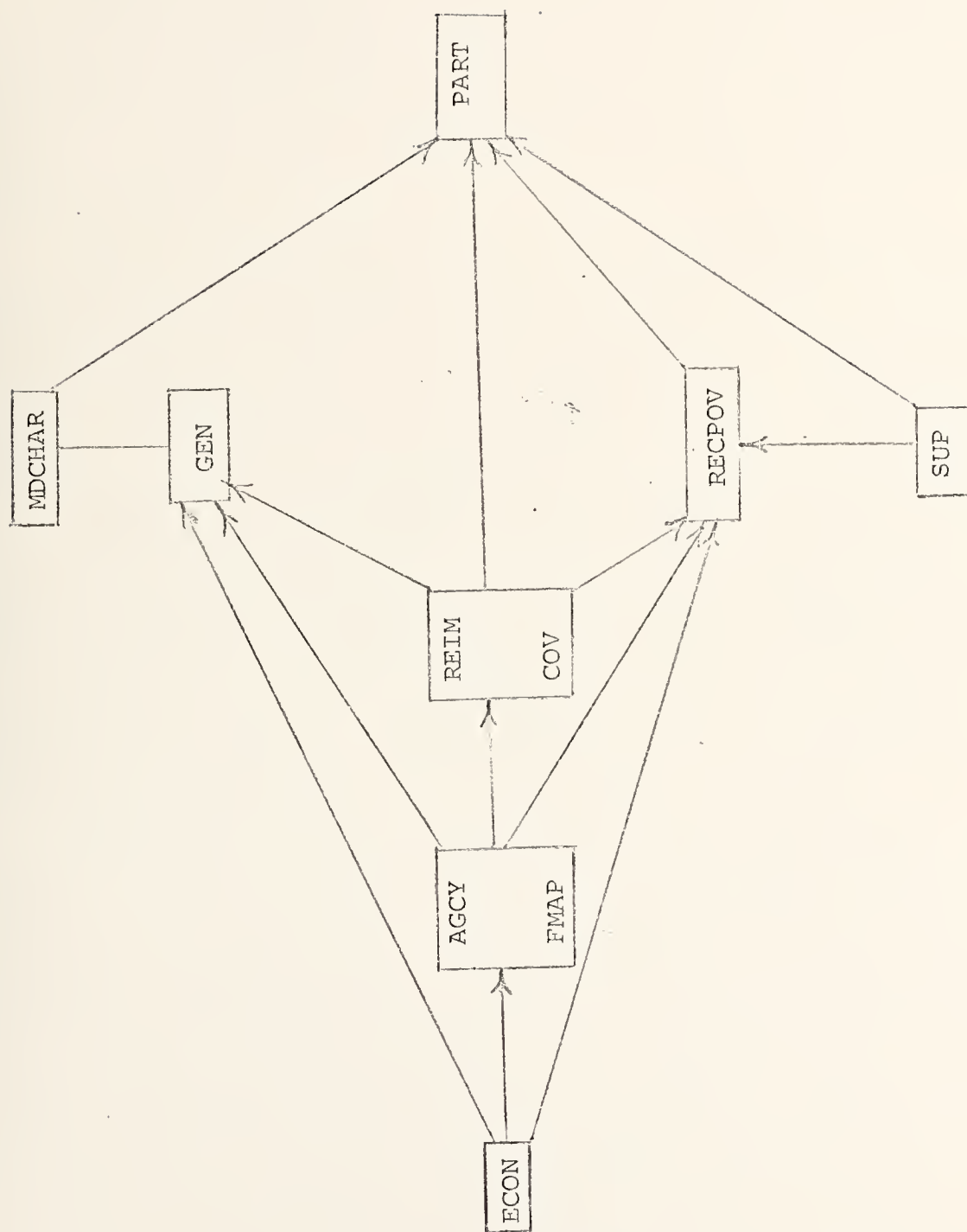


FIGURE 2

Path Model Describing Medicaid Program
Variation and Impact on Physician Participation

4.0 Empirical Specification

The extent of physician participation in Medicaid, the programmatic factors influencing participation, and the politico-economic variables molding program coverage and generosity are estimated based on a recursive model schematically represented in Figure 2 above.

Dependent Variables: Four levels of dependent variables are specified: (1) physician participation (PART); (2) program generosity to physicians (GEN) and patients (RECPOV); (3) underlying program reimbursement (REIM) and coverage (COV) characteristics; and (4) federal/state sharing (FMAP) and locus of Medicaid (AGCY).

FMAP and AGCY (level 4) are the most basic programmatic variables, influencing all the other dependent variables in turn. FMAP is defined as the percentage of state Medicaid expenditures covered by the federal "matching." AGCY is represented by three 0,1 dummy variables: HAGCY=health agency; WAGCY=welfare agency; and UAGCY=umbrella agency (other types constitute the left-out type and are imbedded in the regression intercept).

Medicaid reimbursement is captured by three dummy variables: MCRL=1 when physician payment is based on Medicare reimbursement principles with the application of upper limits, 0 otherwise; (2) FFS=1 if payment is based on a fixed fee schedule, 0 otherwise (the usual Medicare payment mode forms the reference method in the intercept); and (3) CLAIMSP=1 if Medicaid uses an outside fiscal agent to process claims, 0 otherwise.

Medicaid coverage is represented by seven variables: SVC=the number of optional services offered the categorically eligible; MNS=the number of optional services offered the medically needy (=0 if the state has no medically indigent program); LIMITS=1 if states place no significant limits or prior authorization requirements on services; KIDS=1 if the state does not cover all needy children, 0 if it does; BUYIN=1 if the state does not buy-in to Part B Medicare for the Medicaid crossovers, 0 otherwise; ABORTNS=1 if the state does not have any restrictions on abortions, 0 otherwise; MCDSSI=1 if the state uses a more rigorous SSI eligibility standard, 0 if the federal standard is applied; AFDC=percent of Medicaid recipients eligible by way of AFDC vs. SSI or special group.

Medicaid reimbursement generosity (GEN) is measured by the ratio of the

average reported Medicaid fee to the individual physician's usual charge for a follow-up office visit. Program coverage generosity (RECPOV) is measured by the ratio of state Medicaid recipients per annum divided by the census-established number of persons below the poverty line.

Finally, physician participation is characterized in four ways: PART01=1 if the physician participated in Medicaid at all, 0 otherwise; PART%=percentage of the physician's patients covered by Medicaid; LMP30=1 if PART% > 30 percent (or one standard deviation above the mean participation rate), 0 otherwise; and LMP50=1 if PART% > 50 percent (or two standard deviations). Decomposing participation in this fashion permits a separate test of the dichotomous decision to enter the program and once in the program, how extensively to participate. One might expect some variables to be more important in the original decision to participate but much less so on the extent of participation.

Independent Variables: Because we are estimating a recursive model, dependent variables at one level of the specification (e.g., MCRL, MNS) become independent, explanatory variables at another, higher level in the model (e.g., MNS in part explains the number of Medicaid recipients per poor person, RECPOV). Besides these recursive, endogenous variables, there is a set of completely independent variables determined outside the model. These are grouped into three categories: (1) physician characteristics (MDCHAR); (2) state socio-economic status (ECON); and (3) medical supply (SUP).

Physician characteristics are described by a vector of descriptors at the individual physician level and include: TWFMG=1 if the physician was trained in a Third World medical school; HOSPAPL=1 if he has a hospital affiliation; CERTIF=1 if he is board-certified; AGE=physician age; and GP, GS, INT, OBGYN=1 if the physician is a general practitioner, general surgeon, internist, or obstetrician-gynecologist, respectively (pediatricians form the reference group in the intercept).

State socio-economic status, unlike physician characteristics, is represented by a vector of descriptors at the state level, including: POVP=percent of state population below poverty; STINC=cost-of-living adjusted state per capita income (in thousands of dollars); BLKWHT=ratio of nonwhites to whites; MET=percent of state population living in metro areas; P65=percent

of population over age 65 (a sex and under 20 distribution proved insignificant in all regressions); and a set of regional dummies (NE=1, STH=1, WEST=1 if the state were in the North East, South, or West, with North Central as the reference group) to capture other omitted variables correlated with region (e.g., discrimination, anti-regulatory sentiment, health status, attitudes towards medical care).

Medical supply factors included three variables: MDPOP=number of direct patient care physicians per 100,000 state population; HSB=number of short-term hospital beds per 1,000 population; and NHB=number of nursing home beds per 1,000 population. More physicians per capita should reduce pro rata demand, encouraging physicians to take more Medicaid patients. All three supply variables, ceteris paribus, should increase the total number of Medicaid recipients in any period through greater access.

Summarizing, we specify and estimate the following system of recursive equations:

- (1) $PART = p(GEN, RECPOV, CLAIMSP, LIMITS, MDCHAR, MDPOP, ECON)$
- (2) $GEN = g(REIM, MDCHAR, FMAP, AGCY, ECON)$
- (3) $RECPOV = r(COV, FMAP, AGCY, ECON, SUP)$
- (4) $\left. \begin{matrix} REIM \\ COV \end{matrix} \right\} = m(FMAP, AGCY, ECON)$
- (5) $\left. \begin{matrix} FMAP \\ AGCY \end{matrix} \right\} = f(ECON)$

where all variables have been previously defined either as unique variables or sets of variables. Participation should depend positively on GEN, RECPOV, CLAIMSP, LIMITS, and MDPOP and negatively on physician qualifications and economic demand. State generosity to physicians should vary directly with FMAP and inversely with the use of limited Medicare or fixed fee schedules. Relative generosity to individual physicians should also be less when usual fees are higher, which will depend on qualifications and the strength of private demand. It is also possible, however, that relative generosity will be greater in wealthier states so the sign of ECON is ambiguous. If health agencies are biased against physicians, then we might expect them to be less

generous compared to other agency types.

The number of Medicaid recipients per state poor should depend positively on scope of coverage, FMAP, and medical care supply, or resource availability. Holding coverage and supply constant, wealthier states should have fewer poor and hence a greater number of recipients per poor person, but it is possible that extended coverage is considered a superior good by state legislatures, resulting in greater eligibility generosity. Whether certain agency types are more generous to the poor remains an empirical question as well.

Reimbursement practices and service/eligibility coverage will both depend on the underlying economic conditions in the state. Ceteris paribus, poorer states should exhibit less expensive Medicaid programs although systematic differences may arise in the way in which the program is controlled: some may choose to limit eligibility or scope of services while others may require physician participants to bear a greater part of the cost burden through lower fees. Holding state wealth constant, higher federal matching shares should raise generosity in both ways as the state government shares less of increased program costs. Because FMAP is so highly correlated with STINC and POVP,¹² it may be very difficult to obtain separate, stable, effects for all three at once, but an attempt is made because FMAP by itself is such a crucial policy variable. Dropping STINC and POVP leaves the coefficient for FMAP open to misinterpretation, viz., greater federal sharing may appear to result in less generous coverage when, in fact, it is the poorer economic status of the state to begin with that is limiting coverage.¹³

Finally, both FMAP and the locus of the Medicaid agency should depend on socio-economic factors within the state as well as regional preferences. Thus, regional variables may influence program styles (i.e., generosity to physicians and the poor) directly, or indirectly by the kind of Medicaid agency chosen to administer the program. The advantage of a recursive model is that it allows us to trace out both direct and indirect paths, giving us increased insight into why state programs differ.

Estimation Method: All equations were estimated using OLS regression techniques. While three of the four dependent participation variables are dichotomous and probit estimation is the technically preferred technique, all of our

previous work has shown little or no difference, either in sign or statistical significance, between the two methods. OLS is easier to estimate and the results can be interpreted in similar fashion to probit as linear probability functions. The same argument is not as convincing when state qualitative variables are used as dependent variables, so greater care should be exercised in interpreting the results. Still, the coefficients should be unbiased (Kmenta, 1971, p. 427), and as a preliminary investigation the results should be of definite value in understanding program structure holding several variables constant at once.

The sample for the four participation regressions was the full, weighted complement of primary care physicians for the two years combined, adjusted for missing values -- particularly for self-reported usual fees. For the 0,1 Medicaid participation decision, this amounted to 3,724 observations; for the extent of participation among participants only, the number was 2,969. Weights were used to make the sample both regionally and specialty representative of all U.S. primary care physicians.

In estimating the structure of state programs, we really have only 50-odd observations, not 3,724, as all physicians in a state come under the same Medicaid rules and regulations. The state becomes the unit of observation, seriously reducing the degrees of freedom and, inevitably, our power to discriminate among styles of administration. Still, the results will be more meaningful than ignoring the invariance within state and estimating state relationships on individual physician samples. We did weight state values by relative population, however, so that larger states become more important in determining causal relationships. It seems reasonable to weigh the relationship of, say, reimbursement mode to Medicaid fee generosity more heavily in California than in Idaho. Certainly, the effect of any change will be more pronounced in the former.

5.0 Descriptive Findings

5.1 Variations in Medicaid Program Generosity and Coverage

State Medicaid agencies vary widely in how they choose to administer their programs. Table 1 presents the generosity, reimbursement, and administration variables used in our econometric analyses for each state. Since many of these characteristics vary systematically by part of the country, the states are organized by geographic region. (Arizona of course is omitted, as it has no Medicaid program.)

States use a variety of different methods to set physician reimbursement rates under Medicaid; the only federal requirement is that these rates not exceed corresponding payment levels for Medicare. Twenty-four states employ the same (or similar) methods of reimbursement as the Medicare program (MCR in Table 1), a variation of the usual, customary, and reasonable (UCR) criteria originally developed by Blue Shield. About one-half of these states (11) are located in the South. Another 14 state programs also use UCR methods, but have "capped" actual payments (MCRL); generally this upper limit is determined as some percentile of the range of customary charges. The remaining 12 states use traditional fixed fee schedules (FFS). This latter group includes the two largest Medicaid programs in the country, California and New York.

UCR criteria are more flexible than fixed fee schedules since they incorporate both historical and geographic variations in physicians' charges. Medicaid programs using UCR methods thus will be relatively more generous in their payment levels, and we see this empirically in Table 1. Nationwide Medicaid pays physicians 59 percent of their usual fee (GEN), based on a follow-up office visit. State programs paying less than average tend to be those that use either the fixed fee schedule or limited Medicare method of reimbursement. One of the advantages to physicians of the Medicare UCR method is that customary fees increase over time, thus exerting a constant upward push on average payment levels. When upper limits are placed on allowed payments, however, UCR fees begin to resemble traditional fixed fee schedules. Pennsylvania and Illinois, for example, the third and fourth largest Medicaid programs, employ a limited Medicare method and reimburse physicians only 50 and 53 percent of their usual fees, respectively.

TABLE 1

VARIATIONS IN PROGRAM GENEROSITY AND ADMINISTRATION ACROSS STATE
MEDICAID PROGRAMS

	Medicaid Fee/ Usual Fee (GEN)	Recipients/ Poor (%)	Reimb. Methods	Claims Processing	FMAP	Locus of Admin.
<u>North East</u>						
Connecticut	0.61	76.6	MCR	S	50	W
Maine	0.69	54.5	MCR	S	70	U
Massachusetts	0.61	115.1	FFS	S	52	W
New Hampshire	0.69	37.0	FFS	S	63	U
New Jersey	0.53	65.5	MCRL	FA	50	H
New York	0.52	75.8	FFS	S	50	W
Pennsylvania	0.50	37.1	MCRL	FA	55	W
Rhode Island	0.62	62.0	MCR	S	57	U
Vermont	0.56	17.5	MCR	FA	68	W
<u>North Central</u>						
Illinois	0.53	76.5	MCRL	S	50	W
Indiana	0.62	24.4	MCR	FA	58	W
Iowa	0.64	30.5	MCR	FA	52	W
Kansas	0.64	45.0	MCRL	FA	52	W
Michigan	0.65	56.7	MCRL	S	50	W
Minnesota	0.72	35.7	MCR	S	55	W
Missouri	0.46	26.5	MCRL	S	61	U
Nebraska	0.70	20.7	FFS	S	53	W
North Dakota	0.59	11.6	MCR	S	51	W
Ohio	0.64	38.8	MCRL	S	55	W
South Dakota	0.67	13.7	MCR	S	64	W
Wisconsin	0.68	55.1	MCR	FA	59	U

TABLE 1 cont.

VARIATIONS IN PROGRAM GENEROSITY AND ADMINISTRATION ACROSS STATE
MEDICAID PROGRAMS

	Medicaid Fee/ Usual Fee (GEN)	Recipients/ Poor (%)	Reimb. Methods	Claims Processing	FMAP	Locus of Admin.
<u>South</u>						
Alabama	0.60	20.4	MCR	FA	73	O
Arkansas	0.61	20.8	MCR	FA	72	U
Delaware	0.63	42.9	MCR	FA	50	U
District of Columb.	0.86	63.4	MCR	S	50	U
Florida	0.49	17.1	MCR	FA	57	U
Georgia	0.60	24.7	MCR	S	67	U
Kentucky	0.57	26.1	MCR	S	70	U
Louisiana	0.61	21.1	MCR	FA	70	U
Maryland	0.52	33.4	FFS	S	50	H
Mississippi	0.48	19.1	FFS	FA	78	O
North Carolina	0.57	17.0	MCRL	FA	68	U
Oklahoma	0.61	14.1	MCR	S	65	U
South Carolina	0.57	20.1	MCRL	FA	72	W
Tennessee	0.55	20.0	MCRL	FA	69	H
Texas	0.56	17.5	MCR	FA	61	W
Virginia	0.74	22.3	MCR	FA	57	H
W. Virginia	0.59	17.4	FFS	S	70	W
<u>West</u>						
Alaska	0.65	5.3	MCRL	S	50	U
California	0.60	65.6	FFS	FA	50	H
Colorado	0.62	29.7	FFS	FA	54	W
Hawaii	0.82	65.2	MCRL	FA	50	W
Idaho	0.72	25.7	MCR	FA	64	U
Montana	0.66	21.0	MCR	FA	61	W
Nevada	0.60	17.4	FFS	FA	50	U
New Mexico	0.69	13.7	FFS	FA	72	U
Oregon	0.71	31.6	FFS	S	57	U
Utah	0.62	24.7	MCRL	S	69	W
Washington	0.68	42.0	MCRL	FA	52	H
Wyoming	0.63	7.8	MCR	S	53	U
<u>U.S.</u>	0.59	47.5	-	-	56	-

Key: Reimb. Methods: MCR=Medicare, MCRL=Medicare with limit, FFS=Fixed Fee schedule.

Claims Processing: FA=fiscal agent, S=state.

Locus of Medicaid Admin.: U=umbrella agency, W=welfare agency, H=health agency, O=other.

The real value of Medicaid payments to physicians may be lower or higher than stated fees, depending on payment delays and other collection costs that affect the physician's net return. Where states have contracted with a fiscal agent to process their Medicaid claims, payment delays should be shorter thus increasing real Medicaid fees compared with states that process their own claims. Twenty-six states have delegated responsibility for claims processing to such a fiscal agent (FA). The older, industrial states, particularly in the North East and North Central regions, are among those more likely to do their own claims processing.

State programs also differ in their generosity to the poor, i.e., the percent of all poor who are Medicaid recipients. They may cover only the poorest of the poor, as in Wyoming, or they may actually extend benefits to individuals who are not poor according to federal guidelines, as in Massachusetts. As a rule, states that are more generous toward their poor residents are less generous toward their physicians; California, New York, and New Jersey, for example, cover most of their poor in their Medicaid programs, but reimburse physicians 60 percent or less of usual fees.

Other variables in Table 1 include federal-state matching, or cost-sharing, and the administrative locus of the program. The federal medical assistance percentage (FMAP) is lower for richer states (with a minimum of 50%) and higher for poorer ones. In the poorest state, for example, the federal government will pick up 78¢ of every dollar spent by Mississippi on Medicaid services. Given this cost-sharing, we would expect states with higher FMAPs like Mississippi to have extended Medicaid coverage to a greater proportion of their poor compared with states with only 50 percent matching. In fact, we observe the opposite. States with FMAPs of 70%+ tend to cover only a small number of their poor (25% or less). Richer states with the minimum 50 percent matching, on the other hand, usually provide Medicaid services for the majority of their poor.

The state agency responsible for administering the Medicaid program is most frequently the state welfare agency (22 states) or an umbrella human resources agency. Welfare agencies are most commonly used in the North East and North Central regions, and umbrella agencies in the South. Six Medicaid programs are housed in the state health agency.

as of (date)

Table 2 presents coverage characteristics of the different state Medicaid programs, such as the scope of services offered, and special benefits or restrictions. All state Medicaid programs must provide seven basic services: inpatient hospital care; outpatient hospital care; other laboratory and x-ray services; skilled nursing facility (SNF) and home health services for adults; EPSDT services for children; family planning; and physician services. In addition, states may elect to cover additional services as well; these are the services listed as categorically eligible in the first column of Table 2. All states offer some optional services, ranging from as few as three (Wyoming) to as many as 17 (Illinois, Minnesota, Wisconsin, and Washington). The most commonly provided additional services are ICF services, prescription drugs, emergency hospital care, and SNF services for children.

States also may choose to extend Medicaid coverage to the "medically needy," whose incomes make them ineligible for one of the categorical assistance programs. In addition to the seven basic services, optional services may be offered to this group as well; these are the services listed as medically needy in the second column. Twenty states have elected not to provide this optional Medicaid coverage (coded as zero services). With a few notable exceptions (e.g. Indiana and Ohio), these tend to be the less densely-populated and less industrial states. Most of the states who do cover the medically indigent provide basically the same Medicaid services to these eligibles as they do those receiving categorical assistance. A few Medicaid programs, however, are considerably less generous toward their medically needy. Louisiana, Maine, and Pennsylvania restrict the number of optional services offered to these recipients.

State programs also may expand coverage to another financially eligible group: all needy children under 21 years. States without such coverage are disproportionately located in the South and North Central Census regions.

Although state Medicaid programs are mandated to provide physician services, they may impose limitations on the quantity of services covered. Physician supply may be limited across the board, or it may be limited differentially based on the site of care, i.e., hospital, nursing home, office, etc. States may also require that physicians receive prior authorization before supplying certain types of services to patients or

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TABLE 2

VARIATIONS IN COVERAGE ACROSS STATE MEDICAID PROGRAMS

	Categ. Elig. Services	Med. Needy Services	Quantity Limits	Needy Kids	Pt. B Buy-in	Abortion Limits	SSI Elig.	AFDC Rec'd
<u>North East</u>								
Connecticut	15	15	N	Y	Y	N	S	47.5
Maine	12	9	N	Y	Y	N	F	54.1
Massachusetts	15	15	Y	Y	Y	N	F	61.3
New Hampshire	14	13	Y	N	Y	N	S	55.6
New Jersey	16	0	N	Y	Y	N	F	71.6
New York	14	14	N	Y	Y	N	F	57.1
Pennsylvania	12	7	Y	Y	Y	N	F	49.6
Rhode Island	9	8	Y	N	Y	N	F	49.7
Vermont	9	0	N	Y	Y	N	F	53.3
<u>North Central</u>								
Illinois	17	17	N	N	Y	N	S	73.7
Indiana	16	0	N	N	Y	N	S	60.1
Iowa	12	0	N	N	Y	N	F	57.7
Kansas	16	16	N	N	Y	Y	F	46.7
Michigan	14	14	N	Y	Y	N	F	68.6
Minnesota	17	17	N	Y	Y	N	S	52.4
Missouri	7	0	N	N	Y	N	S	54.1
Nebraska	15	15	N	N	Y	N	S	46.1
North Dakota	15	15	N	N	Y	N	F	49.6
Ohio	15	0	Y	N	Y	N	S	68.6
South Dakota	9	0	N	N	Y	N	F	42.1
Wisconsin	17	17	N	Y	Y	N	F	54.6

TABLE 2 cont.

VARIATIONS IN COVERAGE ACROSS STATE MEDICAID PROGRAMS

	Categ. Elig. Services	Med. Needy Services	Quantity Limits	Needy Kids	Pt. B Buy-in	Abortion Limits	SSI Elig.	AFDC Rec'd
<u>South</u>								
Alabama	9	0	Y	N	Y	N	F	35.1
Arkansas	13	11	Y	Y	Y	N	F	31.1
Delaware	7	0	N	N	Y	N	F	63.1
District of Columb.	14	14	N	Y	Y	N	F	74.3
Florida	6	0	N	N	Y	N	F	44.3
Georgia	8	0	Y	N	Y	N	F	35.1
Kentucky	11	11	Y	N	Y	N	F	53.7
Louisiana	10	5	Y	N	N	N	F	31.3
Maryland	10	9	N	Y	Y	N	F	56.3
Mississippi	6	0	Y	N	Y	N	S	41.3
North Carolina	11	11	Y	N	Y	N	S	41.4
Oklahoma	7	7	Y	Y	Y	N	S	29.1
South Carolina	11	0	N	N	Y	N	F	33.1
Tennessee	8	8	N	N	Y	N	F	47.3
Texas	9	0	N	N	Y	N	F	31.3
Virginia	11	11	N	N	Y	Y	S	54.3
W. Virginia	13	13	N	N	Y	N	F	44.7
<u>West</u>								
Alaska	8	0	N	N	N	N	F	63.3
California	16	16	N	Y	Y	N	F	51.7
Colorado	9	0	Y	N	Y	N	F	45.3
Hawaii	11	11	N	Y	Y	N	S	53.7
Idaho	8	0	N	N	Y	Y	F	53.7
Montana	15	15	N	N	Y	N	F	54.1
Nevada	13	0	Y	N	Y	N	F	53.3
New Mexico	12	0	N	N	Y	Y	F	57.1
Oregon	15	0	Y	N	N	N	F	63.3
Utah	15	15	N	Y	Y	N	S	63.3
Washington	17	17	Y	Y	Y	N	F	51.1
Wyoming	3	0	Y	N	N	N	F	53.3
<u>U.S.</u>	12.9	8.8	-	-	-	-	-	54.3

Key: Quantity Limits, Needy Kids Coverage, Pt. B. Buy-In, Abortion Limits: Y=yes, N=no.
 SSI Elig.: F=federal standard, S=state standard.

before exceeding the quantity restrictions. Over one-half of the states (28) have instituted restrictions on the number of physician visits, or have imposed prior authorization requirements. (Some state Medicaid programs without visit limitations may insist that the service be medically necessary, but we do not consider this a true restriction on quantity. Special restrictions are also not considered here, i.e., psychiatric care, abortions -- see column 6 -- and cosmetic surgery.) States in the North Central region are least likely to have limited physician services.

Quantity restrictions may affect one specialty disproportionately more than others: obstetricians. During our survey years (1977-78), four states restricted Medicaid reimbursement of abortions to only unusual circumstances, such as when the mother's life was endangered. With the changing political climate in many states, such restrictions may increase.

There are several ways in which states may limit or expand coverage for their poor elderly residents. First, Medicaid programs may "buy" into the Medicare Part B program for its joint Medicare-Medicaid eligibles. In this instance, the state pays the Part B premium on behalf of its needy elderly and reimburses physicians solely for the deductible and coinsurance (not paid by Medicare). All but four states have taken advantage of this buy-in arrangement (Louisiana, Alaska, Oregon, and Wyoming). Second, although states must provide coverage to all SSI recipients, states historically using more restrictive eligibility criteria were permitted to continue doing so. In 14 states, Medicaid is extended to a narrower range of aged, blind, and disabled individuals.

Finally, the eligibility mix within Medicaid programs provides an indication of states' generosity. The final column of Table 2 presents AFDC recipients as a proportion of all categorical assistance recipients (AFDC and SSI). Since SSI eligibility is usually based on federal standards (as we saw earlier), while AFDC eligibility is determined individually by each state, programs with a greater mix of AFDC recipients presumably have more liberal income levels for eligibility. This appears to be the case; state programs that have extended Medicaid coverage to a higher percentage of their poor also have relatively more AFDC recipients. The AFDC share tends to be particularly small in the South.

5.2 Variations in State Socio-Economic Status and Medical Supply

Medicaid program generosity depends in large part on the relative wealth and poverty within a state. Table 3 presents five variables measuring the socio-economic status of the state. The percent of state population living in poverty varies six-fold, from 5.3 percent (Connecticut) to 29 percent (Mississippi). The higher prevalence of poor persons in the South is readily apparent. (Poverty levels are determined according to uniform federal guidelines; the lower cost-of-living in the South will tend to overestimate poverty in real terms.) The ratio of nonwhite to white population also shows wide variation. Mountain states, such as Idaho and Vermont, have virtually no nonwhite residents, while not surprisingly, the Southern states have relatively large nonwhite populations. The more rural states (% Metro) appear to be poorer on average, a finding which is consistent both across and within regions. States in which less than half the population lives in metropolitan areas tend to have 15 percent or more of their residents living in poverty, well above the national average. Since the elderly poor are categorically eligible for Medicaid (through SSI), we include the percent of state population 65 years and older. The relative elderly population in some states (e.g. Arkansas, Iowa) is almost double that of other states (e.g. Hawaii, Utah).

Table 3 also presents three medical supply variables that are expected to influence the access of Medicaid recipients to care. A tremendous literature exists on the inter-area variation of these factors, a finding also documented here. Physician-population ratios vary three-fold; from approximately one physician per 1,000 in Arkansas, Mississippi, and South Dakota to almost three physicians in Maryland. (The extremely high ratio in D.C. reflects border-crossing; many Maryland and Virginia residents obtain care from D.C. physicians.) The range in hospital and nursing home bed supply is most dramatically noted in two states (in Table 3): Alaska and California. With the exception of California, the relative number of beds is much lower in the West compared to other regions. Generally, states with higher hospital bed-population ratios also have higher nursing home bed-population ratios.

TABLE 3

VARIATIONS IN SOCIO-ECONOMIC STATUS AND MEDICAL SUPPLY ACROSS STATES

	% Poor	Income	Nonwhite/ White(%)	% Metro	% Age 65+	MD/ Pop(000)	Hosp. Bed Pop(000)	NH Beds/ Pop(000)
<u>North East</u>								
Connecticut	5.3	8,061	6.1	88.3	10.9	2.24	11.0	24.4
Maine	10.4	5,743	0.3	23.3	12.0	1.36	4.9	8.6
Massachusetts	6.3	7,258	3.2	86.2	11.9	2.45	26.3	50.9
New Hampshire	6.7	6,536	0.3	36.3	11.0	1.59	3.4	6.3
New Jersey	6.1	7,994	14.6	92.2	11.0	1.77	30.0	34.5
New York	8.5	7,537	14.4	88.5	11.6	2.43	84.9	102.6
Pennsylvania	7.9	7,011	9.9	80.5	12.1	1.73	55.8	64.1
Rhode Island	8.5	6,775	3.3	92.3	12.6	1.95	3.5	7.3
Vermont	14.7	5,823	0.2	0.0	11.1	2.03	2.3	5.1
<u>North Central</u>								
Illinois	7.7	7,768	14.7	81.3	10.6	1.72	55.1	87.8
Indiana	7.4	6,921	5.9	67.8	10.4	1.17	23.6	35.9
Iowa	8.9	6,878	2.0	37.4	13.0	1.15	16.8	32.9
Kansas	9.7	7,134	5.1	45.9	12.6	1.44	13.0	22.5
Michigan	7.3	7,619	10.5	81.4	9.3	1.45	39.8	66.4
Minnesota	8.3	7,129	1.0	64.4	11.4	1.77	23.6	43.0
Missouri	11.6	6,654	7.7	63.5	12.9	1.55	26.0	33.6
Nebraska	10.1	6,720	2.6	44.7	12.8	1.38	9.3	23.0
North Dakota	12.4	6,190	0.2	22.7	11.7	1.18	4.2	6.8
Ohio	7.6	7,084	11.2	79.9	10.4	1.50	49.5	64.1
South Dakota	14.8	5,957	0.2	14.7	12.7	0.98	3.7	7.8
Wisconsin	7.4	6,890	4.2	60.2	11.5	1.41	24.5	52.6

TABLE 3 cont.

VARIATIONS IN SOCIO-ECONOMIC STATUS AND MEDICAL SUPPLY ACROSS STATES

	% Poor	Income	Nonwhite/ White(%)	% Metro	% Age 65+	MD/ Pop(000)	Hosp. Bed/ Pop(000)	NH Beds Pop(000)
<u>South</u>								
Alabama	20.7	5,622	42.4	61.8	10.8	1.11	17.6	19.3
Arkansas	22.9	5,540	27.8	38.4	13.3	1.09	9.7	18.7
Delaware	8.3	7,697	18.4	68.9	9.2	1.55	2.0	2.2
District of Columbia	12.7	8,999	256.9	100.0	10.3	5.92	5.0	2.9
Florida	12.7	6,684	18.3	86.0	17.1	1.75	40.4	32.9
Georgia	16.8	6,014	46.4	56.8	9.0	1.36	21.0	29.6
Kentucky	19.3	5,945	8.9	45.5	11.0	1.28	14.6	20.3
Louisiana	21.6	5,913	47.2	63.4	9.3	1.41	17.2	19.1
Maryland	7.7	7,572	32.8	85.1	8.7	2.71	13.3	18.9
Mississippi	29.0	5,030	61.3	26.5	11.1	1.02	11.0	8.9
North Carolina	16.5	5,935	30.7	45.3	9.6	1.39	21.6	24.4
Oklahoma	15.8	6,346	6.9	55.6	12.4	1.21	12.1	26.1
South Carolina	19.1	5,628	47.8	48.3	8.6	1.23	10.8	8.6
Tennessee	18.3	5,785	18.7	63.1	10.8	1.47	22.0	20.1
Texas	14.7	6,803	16.3	79.1	9.6	1.46	57.1	101.4
Virginia	7.6	6,865	27.2	65.6	8.8	1.62	19.6	28.5
W. Virginia	18.1	5,986	4.1	36.4	11.8	1.31	10.3	5.6
<u>West</u>								
Alaska	9.3	10,586	3.8	43.7	10.8	1.16	0.8	0.8
California	8.4	7,911	8.4	92.8	10.0	2.19	82.8	139.1
Colorado	9.7	7,160	3.5	80.6	8.6	1.98	10.7	22.7
Hawaii	7.7	7,677	2.2	80.9	7.1	1.74	2.6	3.2
Idaho	10.9	5,980	0.2	16.8	9.7	1.05	3.2	4.8
Montana	10.4	6,125	0.5	24.4	10.4	1.26	3.8	5.3
Nevada	7.0	7,988	5.6	80.9	8.0	1.28	2.5	1.6
New Mexico	18.6	5,857	1.8	33.5	8.2	1.46	3.8	3.0
Oregon	8.6	7,007	1.3	59.9	11.5	1.73	9.0	15.9
Utah	9.2	5,923	0.4	78.8	7.7	1.63	3.8	4.6
Washington	7.6	7,528	1.9	71.4	10.6	1.78	12.0	30.1
Wyoming	9.3	6,562	0.6	0.0	8.6	1.13	1.7	1.8
<u>U.S.</u>	10.4	7,423	14.6	73.8	10.9	1.64	41.1	59.1

6.0 Econometric Findings

Tables 4 and 5 provide regression results, first, for the four participation equations and program generosity to physicians, and then for the reimbursement and service coverage variables. The first table is based on the individual physician as the unit of analysis while the second is on a statewide basis. In Table 4 statistical significance is noted by one or two asterisks representing the 90 and 95 percent confidence intervals, respectively. Because of the limited degrees of freedom in the state regressions, a three asterisk hierarchy is used with one asterisk representing the 85 percent confidence interval ($t=1.45$). The explanatory power of the overall equation (or R^2) along with its associated F-statistic and degrees of freedom is given at the bottom of each column.

Taking the 0,1 decision to participate in Medicaid first, we find most variables to be highly significant and in the hypothesized direction. Wherever the Medicaid fee is higher relative to the physician's usual charge, he is definitely more likely to participate. A ten percentage point increase in the Medicaid relative fee (around a mean of about .60) would raise the probability of a physician participating by about one percent (.88 percent to be exact).

Holding the proportion of the state population in poverty constant, more Medicaid recipients per poor person also encourages participation. A ten percentage point increase would raise the likelihood of participation by 1.3 percent, ceteris paribus.¹⁴

RECPOV is almost 50 percentage points greater in Massachusetts than New Jersey (i.e., 115% vs. 65.5%), implying that physicians in the former state are 6.5 percent more likely to participate based on program generosity to the poor alone. Massachusetts is also 7 percentage points more generous to physicians in terms of Medicaid relative fees, making the total generosity effect slightly over 7 percent ($6.5\% + .6\%$). Massachusetts, compared to a poor southern state like Mississippi, illustrates even better the impact of program generosity. Physician (GEN) and eligible-poor (RECPOV) generosity in Massachusetts are 13 and 96 percentage points greater, respectively. When

TABLE 4

PHYSICIAN PARTICIPATION AND STATE MEDICAID PHYSICIAN GENEROSITY REGRESSIONS

INDEPENDENT VARIABLE	DEPENDENT VARIABLE				
	PART01	PART%	LMP30	LMP50	GEN
INTERCEPT	.328**	-1.297	-.175	-.223**	.860**
GEN	.088**	6.277**	.050	.029	---
RECPOV	.128**	9.249**	.097**	-.032	---
CLAIMSP	.034**	.708	.016	-.022**	-.002
LIMITS	.037**	.248	.007	.014*	---
TWFMG	.057**	3.310**	.025	.030**	.034**
HOSPFL	.079**	-1.143	.019	.024	-.052**
CERTIF	.020	-4.158**	-.074**	-.029**	.008
AGE	.016**	.082	.003	.008**	-.006**
AGE2	-.0002**	-0.0003	-.00001	-.0001**	.0001**
GP	.009	-1.001	-.061**	.034**	-.052**
GS	.127**	-1.160	-.034	-.015	-.108**
INT	.041	-1.292	-.047**	-.010	-.120**
OBGYN	-.103**	-3.129**	-.052*	-.011	-.133**
MDPOP	-.001	-0.019	-.001	-.0002	---
NE	-.045**	3.071**	.050**	.075**	-.069**
STH	.003	-1.718	-.049**	-.014	-.045**
WEST	.060**	5.033**	.088**	.033**	.052**
POVP	-.004	.742**	.010**	.001	-.005**
BLKWHT	-.248**	4.442**	.183**	.052**	.025*
FMAP					.003**
STINC					-.020**
HAGCY					.046*
WAGCY					.063**
UACGY					.033
MCRL					-.044**
FFS					-.040**
R ²	.096	.1	.056	.055	.13
F (DFE)	20.7 (3724)	14.1	9.2 (2969)	9.1 (2969)	26 (3721)

*90% C.I.

**95% C.I.

weighted by the regression coefficients in column (1), Table 4, we find that physicians in Massachusetts are 13.4 percent ($=.088*.13 + .128*.96$) more likely to participate in the state Medicaid program, holding other demand, supply, and programmatic variables constant.

Medicaid programs using an outside fiscal agent for claims processing are also more likely to get physicians to participate (about 3.4% according to our estimates). As Massachusetts does its own processing and Mississippi does not, this offsets the previous 7 percent generosity effect by about 50 percent, certainly not an insignificant adjustment. Placing limits on services or requiring prior authorization does not seem to deter participation, as evidenced by a positive coefficient on LIMITS.

Among the physician credentials and training, we find that:

- third world FMGs are much more likely to participate in Medicaid (ceteris paribus about 5.7% more);
- those with hospital affiliations are nearly 8 percent more likely (no doubt due to their treatment of the Medicaid poor in institutional settings);
- younger physicians up to the age of 40 are more likely to participate, then less so afterwards; and
- general surgeons are more likely to participate while obstetricians-gynecologists are less likely among primary care physicians.

Holding demand and Medicaid program characteristics constant, we find that physicians practicing in the Northeast are 4.5 percent less likely to participate (relative to physicians in the North Central region) while those in the West are 6 percent more likely. Whether regional differences are due to systematic variations in attitudes towards the poor in general or the way in which the Medicaid program is administered in particular is unknown.

Finally, physicians practicing in states with relatively greater non-white populations are also less likely to participate. In some instances this may be due to overt discrimination, but more likely the result is explained indirectly by housing discrimination. In states with large, concentrated nonwhite populations, most physicians do not practice in areas where minorities live. Therefore, although nonwhites make up 47 percent of Medicaid recipients vs. only 15 percent of the U.S. population (Muse, 1981, Table C), implying greater physician participation, the fact that most white physicians are not geographically accessible to minorities (except in an institutional setting) results in significant racial inequalities in access,

as we shall see.

Once a physician decides to accept Medicaid patients, the decision to devote a certain percentage of his/her practice to Medicaid is usually influenced by the same programmatic variables, although interesting differences emerge. Again, the more generous the program is to physicians and the eligible-poor, the greater will be the extent of physician participation. A ten percentage point increase in physician generosity increases participation about six-tenths of a percentage point (around a mean of 16.4), while a similar increase in eligible-poor generosity would result in nearly a one percentage point gain. The associated elasticities of .22 and .27, while low, are significant nonetheless.

Neither the use of an outside fiscal agent nor the imposition of limits and prior authorization have any effect on the depth of participation, which is not all that surprising. Once a physician has decided to participate he no doubt adjusts his billing/collection behavior, to some degree, to accommodate the eccentricities of Medicaid reimbursement.¹⁵

Among physician characteristics we find that:

- not only are FMGs more likely to participate, but they participate to a greater degree once in the program;
- OB-GYNs are just the opposite of FMGs; less likely to participate, and if they do participate, it is at a reduced level;
- board-certified physicians, while not different in their decision to participate, limit their participation by about 4 percentage points relative to their uncertified colleagues, holding age and specialty constant; and
- younger physicians and surgeons, once in the program, do not participate to any greater extent than the average.

Western physicians not only are more likely to participate in Medicaid but participate to a much greater extent (5 percentage points) than their peers in the Northcentral and Southern regions. Interestingly, physicians in the Northeast, although less likely to participate, do so in greater depth once they make a commitment to the program. This implies relatively fewer physicians each treating a larger percentage of the Medicaid population.

And finally, physicians practicing in poorer states with extensive minority populations participate in greater depth, even holding program generosity constant. This again reflects the maldistribution of the Medicaid population and the unequal burden placed on physicians practicing in Medicaid areas. For example, in the LMP30 and LMP50 equations, greater minority populations are associated with higher probabilities that a practice has at least 30 percent of its practice Medicaid. Greater percentages of the population in poverty and receiving Medicaid also raise the probability that the participating physician is operating a large Medicaid practice, as predicted.

Medicaid generosity to physicians does not seem to have a net effect on LMP probabilities, on the other hand. Apparently, the financial incentive to participants of expanding their Medicaid caseloads is offset by the influx of new participants, leaving the maldistribution of patients between small and large Medicaid practices unaffected. Thus, overall access to office-based primary care is significantly improved without patients having to resort to Medicaid mills.

U.S.-trained, board-certified physicians are consistently less likely to be running LMPs using either LMP criterion while internists and ob-gyns are significantly less likely to have LMPs with at least 30 percent Medicaid. General practitioners present something of an anomaly, being less likely to have a large (i.e., 30%) Medicaid practice but more likely to have an extra-large (> 50%) practice. Compared to the other primary care specialists, either the GP is not participating at all in Medicaid, or he/she participates very extensively. Locational incongruities may again explain this finding if many GPs are practicing in non-Medicaid areas while those that are practicing in poor areas must see large numbers of Medicaid eligibles to achieve a target income. Sharper differences in GP attitudes towards the Medicaid program could also produce such a result.

Clear regional differences in the size distribution of Medicaid practices also exists, even after several program variables are accounted for. In both the Northeast and West, participants are significantly more likely to be running an LMP, while in the South they are significantly less so. Compared to physicians in the Northcentral region, Northeast participants are 5-7.5 percentage points more likely to have Medicaid practices; in the West the range is from 3.3 to 8.8 percentage points; while in the South the

probability is 5 percent less. Relatively fewer LMPs in the South is in distinct contrast to our previous findings (Mitchell and Cromwell, 1980) and may be due to our holding RECPOV and POVP constant here.

The last column in Table 4 provides an explanation of Medicaid program generosity to participating physicians. Programmatic variables include those associated with reimbursement (MCRL, FFS, CLAIMSP), FMAP, and agency locus. These are supplemented by physician characteristics and state economic conditions which affect private demand and usual fees, as well as the largesse of the public sector in extending Medicaid benefits.

Sloan's (1979) work is the only other comparable analysis of Medicaid fee generosity that we are aware of,¹⁶ and while our results are confirmatory in key respects, important policy differences also emerge. First, like Sloan we also find that states with higher federal matching are more generous to physicians, holding income and the relative size of the poverty population constant. A ten percentage point increase in FMAP would raise Medicaid payments as a percentage of the physician's usual office fee by 3 percentage points (an elasticity of .25). Our elasticity is quite a bit lower than Sloan's, however, although the specifications are very similar except for the inclusion of regional dummies. (Our sample is also based on over 3,700 primary care physicians surveyed by HCFA/NORC in 1977 and 1978 compared to 769 physicians used in Sloan's study.) Still, definite evidence does exist that states will "pass on" to physicians in the form of higher fees at least some of the increased share of federal expenditure matching.

Like Sloan, we also find that states with relatively poorer populations are also less generous, which is one reason for the inverse federal matching share. Holding the percent in poverty constant, however, we actually find that wealthier states on average are less, not more, generous to physicians. In other words, in adjusting their Medicaid rates for stronger private demand, wealthier states generally do not keep pace with private fees.

Of particular interest are the three reimbursement variables. According to equation (5), the use of either Medicare reimbursement principles with limits or a fixed fee schedule reduces program generosity to physicians, and by almost exactly the same amount (4 percentage points). This is in distinct contrast to Sloan (1979, p. 24), who found no reimbursement effects on generosity. Using outside fiscal agents for processing claims has no net effect on generosity, nor should it if the program itself is independently setting rates.

We also find statistically significant effects relating to the locus of Medicaid operations. Compared to "other" organizational structures, both health and welfare agencies are more generous to physicians, welfare agencies particularly so. Umbrella agencies are somewhat less generous than either of these forms, but still more so than the special groups. According to MMMI (1979, Table 67), Alabama (Governor's office), Georgia (independent agency), Mississippi (independent commission) and New Jersey (Department of Human Services) have special organizations. Why these agencies would be less generous, holding income and region constant, is unknown.

Racial composition and region also have effects on Medicaid generosity. Contrary to some previous research (Orr, 1976; but see also Vogel and Morrall, 1973), white legislatures do not skimp on Medicaid payments to physicians serving the poor when minorities are a greater proportion. If anything, they are more generous. Strong regional differences do exist, however. Compared to programs in the North Central region, Western states are significantly more generous to physicians (about 5 percentage points) while North Eastern and Southern programs are significantly less so. The large, urban, North Eastern states are particularly stringent, offering nearly 7 percent less than in North Central states, and over 12 percent less than in the West. Nor can these differences be attributed to greater numbers of poor or less generous payment modes, for these are already held constant. Philosophies regarding the scope and purpose of Medicaid, and welfare more generally, may differ systematically by region, an hypothesis we now consider in looking at the programmatic variation more closely.

Table 5 provides estimates of the impact of programmatic and other, exogenous factors on generosity to the eligible-poor and the sources of the underlying variation in Medicaid program structure. (Two program variables of particular interest, CLAIMSP and LIMITS, proved to be statistically unrelated to any of the underlying variables, and the results are not shown.)

Of the scope of coverage variables, only MNS and AFDC proved to be significant at conventional levels in explaining RECPOV, although MCDSSI was nearly significant at the 15 percent level. The coefficient for MNS implies, ceteris paribus, a 1.1 percentage point increase in Medicaid recipients per potential eligible for every optional service covered under the state's medically needy program (if the state offers one).¹⁷ Twenty-one states do not cover the medically indigent at all while Illinois, Minnesota,

TABLE 5

MEDICAID ELIGIBLE-POOR GENEROSITY AND PROGRAM CHARACTERISTICS REGRESSIONS

INDEPENDENT VARIABLE	DEPENDENT VARIABLE								
	RECPOV	MCRLFFS	MNS	SVC	KIDS	MCDSSI	HAGCY	WAGCY	FMAP
INTERCEPT	.706	2.82	75.5***	13.9	-1.51	.58	-.54	.38	81.7***
FMAP	-.013*	-.02	-.7***	.1	.02	.03	---	---	---
POVP	.030***	.04	.6	-.1	.02	-.05	-.03	-.00	1.0***
STINC	-.010**	-.23	-5.4**	-.5	.25	-.00	.11	.06	-.5***
BLKWHT	-.133	.37	1.0	3.3	-.23	.22	---	---	---
HAGCY	-.152	.56	10.0	4.5**	-.27	-.12	---	---	---
WAGCY	-.133	.33	7.4	2.8	-.00	-.11	---	---	---
UAGCY	-.075	.13	7.4	1.2	-.04	-.18	---	---	---
NE	.182***	-.00	-3.5	-1.7	-.42***	-.57***	.17	.03	-3.7***
STH	-.129	-.60***	-4.8	-5.6***	.03	-.35	.47***	-.47**	-.6
WEST	-.044	.12	1.3	-.9	-.31*	-.52***	.67***	-.66***	-.63
SVC	.008								
MNS	.011***								
KIDS	.086								
BUYIN	-.064								
ABORTNS	.059								
MCDSSI	-.068								
MET	.005***								
P65	-.009								
MDPOP	.001**								
HSB	-.015								
NHB	.007***								
AFDC	.008***								
R ²	.89	.39	.31	.62	.54	.32	.39	.33	.84
F	10(27)	2,5(39)	1.7(39)	6.5(39)	4.6(39)	1.8(39)	5.6(44)	4.4(44)	47(44)

* 0.1% C.F.
 * 0.01% C.F.
 * 0.001% C.F.

Wisconsin, and Washington offer as many as 17 services under the program. Comparing one of these states with a state without a medically needy program (such as Vermont or Texas), Medicaid recipients per poor person would vary by 18.7 percentage points around a national mean of 47.5. This is quite a large effect for a single variable, holding all other influential factors constant.

States also differ considerably in program mix, ranging from a low of 29 percent AFDC recipients in Oklahoma to a high of 75 percent in Washington, D.C. The AFDC coefficient implies a .8 percentage point increase in generosity for every percentage point increase in the share of AFDC in total Medicaid recipients. For Oklahoma vs. D.C., a difference of 46 percentage points in AFDC's share explains 37 of the 49 percentage points difference in RECPOV between the two states; the optional medically needy program explaining another 7.7 percent points. As non-AFDC eligibles generally have higher utilization rates (Cromwell and Schurman, 1981; Brook, 1978), the positive association between AFDC and RECPOV must be interpreted as an eligibility, or coverage, effect. States differ considerably in their age-sex-marital status mix,¹⁸ explaining at least part of the observed variation in RECPOV. The remainder is due to more-or-less generous income and health status eligibility criteria. Oklahoma, having an older (relative to D.C.) and more intact family population, should have more Medicaid recipients per poor person, not fewer. The D.C. AFDC program must exhibit a much higher ratio of actual to potential eligibles to offset the negative effect of a younger, and presumably less disabled, poverty population. Clearly, in states where AFDC criteria are more generous, a greater percentage of the poor -- particularly children -- will be Medicaid-eligible, thereby raising Medicaid utilization and expenditures, not only absolutely but relative to the poor population as well.

The one other coverage variable that was nearly significant was MCDSSI. If we were to accept the coefficient as an unbiased estimate, states using their own, more restrictive SSI eligibility standard would have a considerably smaller ratio of Medicaid recipients to state poor (about 6.8 percentage

points less). Thus, 6.8 of the roughly 20 percentage point difference in RECPOV between, say, Minnesota (35.7%) and Wisconsin (55.1%), two otherwise very similar states, can be attributed to Minnesota's more restrictive SSI standard.

The fact that the number of optional services offered the categorically eligible proved unrelated to relative generosity is not too surprising in that the basic medical services must be offered to all categorical eligibles. Apparently what really distinguishes Medicaid programs, at least in terms of generosity to the eligible poor, is not depth of service coverage as much as breadth of eligibility coverage.

Neither FMAP nor the locus of agency administration had a direct effect on RECPOV; FMAP, in fact, was negative and nearly significant, implying less generous programs where federal cost-sharing is higher. This is in distinct contrast to program generosity to physicians where FMAP was positive. Theory predicted that, holding state wealth (and hence the ability to support Medicaid) constant, more federal sharing would be manifested in more depth and breadth of coverage for potential eligibles. We find no evidence to support this. In fact, FMAP is negative and significant in the equation explaining medically needy services as well. Numerous specifications were tried, selectively dropping the colinear POVP and STINC variables,¹⁹ agency and regional dummies and the coverage variables, but the sign of FMAP remained consistently negative.

It is difficult to accept this result at face value in that it implies reductions in program generosity to the eligible-poor with increased federal matching, or conversely, more generous programs where matching is reduced (as is currently being done). Multicollinearity using a single-period state cross-section may be too serious among FMAP, POVP, and STINC for a true estimate of FMAP's effects. Alternatively, one or more of the included variables is inadequately measured, or a variable is left-out entirely, explaining why FMAP has the wrong sign. What variable could be left-out is hard to say, particularly when regional dummies are included to capture such unmeasured effects, albeit only at the regional level. The historical fact is that, with the exception of Maine, states with very high FMAPs (70 or above) have exceptionally limited Medicaid programs as measured by recipients-to-poor (on the order of 20% compared to 47.5% nationwide).

While one is reluctant to draw policy implications of changing FMAP across the board, we can say that nowhere in our descriptive or econometric results do we find any evidence that federal matching per se enhances program generosity to the eligible-poor.²⁰ Even if statistical limitations precluded a "correct" estimate, the basic fact remains: those states enjoying heavy federal matching have not chosen to expand their Medicaid coverage to the poor in any demonstrable way (again Maine appears to be a notable exception), but rather have used the savings for other purposes, e.g., education, public works, lower overall tax rates.

States with greater percentages of their population in metro areas have significantly greater Medicaid utilization (RECPOV is half a point higher for every one point increase in percent metro). With other medical care supplies and program characteristics being held constant, a positive density effect may be attributable to both (a) poorer health status (e.g., pollution, accidents); and (b) more ready access to providers.

More physicians, hospital and nursing home beds per capita also increase Medicaid utilization by the poor; physicians and long-term care beds significantly so. Holding program generosity constant, states with more plentiful supplies of physicians and nursing homes can expect considerably greater utilization and (presumably) expenditures and should find controlling the Medicaid budget more difficult in austere times.

Finally with regard to regional effects on generosity, the results suggest that North Eastern states, once all economic, medical, and programmatic characteristics are accounted for, remain the most generous to potential eligibles; the South, somewhat less so. In fact, North Eastern states exhibit RECPOV ratios over 18 points higher on average than North Central states, ceteris paribus, and over 30 points higher than in the South. Together with the opposite finding on physician generosity, we conclude that a distinctive Medicaid program style emerges on a regional basis, one that impinges quite differently on providers vs. the poor. Exactly how and why this occurs is unknown although more liberal attitudes toward the poor in the North East and a stronger faith in the efficacy of medical care may be contributory.

Going behind GEN and RECPOV to their underlying determinants, we explain,

first, a state's decision to deviate from Medicare CPR reimbursement principles for physicians (MCRLFFS). Unfortunately, none of the programmatic variables appeared to be systematically related to this decision. Only health agencies "appear" to use limited CPR or fixed fees in paying physicians, but the associated t-statistic was only 1.1. In fact, the only variable to achieve statistical significance was the regional variable for the South, suggesting that southern states as a whole are consistently less likely to impose reimbursement limitations. The net effect is to make the Southern programs relatively more generous than they might appear in the GEN equation, although the adjustment for payment mode still does render them as generous as other areas.

Taking the set of four coverage equations as a group (BUYIN and ABORTNS equations were dropped because of low overall statistical significance), we find that:

- High FMAP programs offer significantly fewer services to the medically needy, but not to the categorical eligibles; they are also somewhat more inclined to use the more restrictive state SSI standard;
- Medicaid programs administered by health agencies tend to offer a broader range of services -- particularly to the categorically needy;
- Southern Medicaid programs offer significantly fewer services to the categorically needy, even after adjusting for their lower tax bases and higher FMAPs; and
- North Eastern and Western Medicaid programs, and Southern states somewhat less so, are more likely to use the federal SSI standard than those in the North Central part of the country.

This leaves only the explanation of the locus of Medicaid administration and a program's FMAP to be explained. As umbrella agencies were not found to be significantly different from special agencies in their impact, we concentrated on the reasons why states chose either health or welfare agencies. No effects were found for either STINC or POVP, implying that poorer or wealthier states do not seem to prefer one type over the other. A pronounced regional bias does exist, however, with Southern and Western programs preferring to administer their Medicaid programs out of independent health departments (or umbrella agencies), while North Eastern and North Central programs are more likely to jointly administer Medicaid and welfare out of the welfare department.

Finally, a state's FMAP is highly correlated with state per capita income, the size of its poverty population, and holding both of these variables constant, the Northeast region, which is surprising. If FMAP is based strictly on a formula relating state to national per capita income, then variations in STINC should completely explain FMAP and all other variables should be insignificant. But because HCFA uses a nonlinear FMAP formula, e.g., $FMAP = 1 - .45(ST/US)^2$, where ST, US=State and U.S. per capita income, respectively, with lower and upper limits of 50 and 83 percent, the correlation in a simple linear regression such as ours will not be perfect. POVPP evidently picks up some of the nonlinearity, which is intended as the "procedure magnifies any differences between the State's income and the national average (MMMI, 1979)."

Yet even holding these variables constant, FMAPs in the Northeast region are about 3.7 percentage points below those in the rest of the country. Because HCFA does not adjust incomes for regional cost-of-living, it may introduce a systematic bias against Medicaid programs in the Northeast where both living and medical care costs are particularly high. Northeastern states may only appear to be much wealthier, and hence capable of supporting more of program costs, when in fact taxpayers face higher costs generally and are less able in real terms to support the program. These results suggest a re-evaluation of FMAP in terms of each state's real potential tax base using efficiency and equity criteria.

7.0 Program Styles and Physician Participation in Medicaid

Given these results, is there anything that can be said concerning Medicaid program "styles," and can they be related in any way to physician willingness to participate? The answer to both is a qualified yes.

We can say with some certainty that states do vary systematically in their generosity to providers and potential eligibles, and that this has a direct impact on physician participation. First, many of the variables explaining the two types of generosity exhibited opposite signs in the GEN and RECPOV equations, including FMAP, POVP, AGCY, and REG. The single best example of this phenomenon is the North East regional dummy: states in this region clearly are much less generous to physicians and broader in their coverage of the poor, ceteris paribus, than anywhere else in the country. Taking all endogenous factors (e.g., reimbursement mode) into consideration, North East states, in setting Medicaid fees, are 8 percentage points less generous than in North Central areas (12 points less so than in the West), and a remarkable 30 points more generous in terms of Medicaid recipients per poor person. This is true after adjusting for higher per capita incomes and the greater availability of physicians and other medical care resources. The net effect of North Eastern generosity on physician participation is positive, with broader eligibility/service coverage more than offsetting the slight negative participation effect associated with lower fees. Western programs, by contrast, are more generous than average to both physicians and the poor, although nowhere near as much to the poor as in the North East. The result is uniformly greater physician participation, both in terms of the probability of participating as well as the extent.

In terms of particular coverage and reimbursement modes, Southern programs more often use generous Medicare CPR principles and offer many fewer optional services to the categorically eligible. Nevertheless, these programs on the whole are less generous to physicians and not significantly less so (except compared to the North East) to the poor. Compared to other regions we find no compelling evidence that Southern programs seriously restrict Medicaid access to the poor once their lower incomes, rural demographics, and more limited medical resources are taken into account.²¹

ENDNOTES

1. A more complete exposition of the two-market demand model, including a comparative statics analysis of changes in exogenous demand and supply variables, can be found in Sloan, Mitchell, Cromwell (1978).
2. For a monopolist facing a downward sloping demand curve, marginal revenue would be below the demand curve. If the physician were a perfect price discriminator, however, marginal revenue and demand curves would coincide. The relevant marginal revenue curve, therefore, will be closer to the demand curve the more the physician price discriminates.
3. While the total Medicaid pool would more than fill the caseload of any individual physician, limited access implies a finite potential pool that a physician could realistically serve. This may or may not exhaust the rest of his patient contact hours.
4. This assumes no demand inducement. If physicians can protect themselves against competition by arbitrarily shifting private demand, then more physicians in an area would not necessarily lead to fewer private visits per physician and the corollary, more Medicaid visits. Perceived disadvantages to serving Medicaid patients (e.g., payment delays, discrimination), may actually encourage some physicians to induce private demand rather than enter the public market.
5. According to the 1975 HCFA physician survey, 77 percent of nonparticipants did not feel the absence of Medicaid eligibles explained their non-participation. Other factors like low fee schedules were emphasized. See Sloan, Cromwell, Mitchell (1978, p: 122).
6. While d_i is usually defined in terms of subjective preferences, real physician costs associated with the Medicaid program which lower net returns (e.g., complicated forms, payment delays) are comingled with preferences and are very difficult to disentangle.
7. Actually all physicians would receive f_m if no specialty or physician-specific differences in allowable fees existed. Medicaid programs do make specialty distinctions. In addition, many use UCR reimbursement techniques based on individual physician profiles.
8. For a mathematical treatment of losses due to discrimination in the context of employer discrimination, see Thurow (1969, p.115).
9. This point is clearly arbitrary. In the empirical work that follows point 1, where an SMP becomes an LMP, has been defined as either 30 or 50 percent of visits Medicaid. This percentage was determined based on inspection of the size distribution of Medicaid participation.

10. Within the five primary care specialties in our sample, for example, the number of weekly visits varied from 191 for general practitioners down to 145 for internists and OB-GYNs.
11. For reasons why they might or might not, including such variables as practice size and specialty, see Ernst (1976).
12. The zero-order correlation between FMAP and STINC was $-.61$, while for POVP it was even higher, $.89$. Because FMAP is based on a constrained relationship of state to national per capita income, not to the poverty population per se, one might expect the correlation between FMAP and STINC to be much higher still. The lower correlation is explained by our cost-of-living adjustment. POVP apparently is a much closer proxy for the cost-sharing algorithm than our measure of state income itself.
13. The zero-order correlation between FMAP and RECPOV, for example, is $-.69$, implying less generous programs in states where the federal government bears a greater proportion of expenses. Raising FMAP even further, however, certainly would (should?) not lower program generosity if done across the board in all states.
14. While a feedback of physician participation on RECPOV certainly exists, the fact that Medicaid recipients include all users of medical services -- physician or otherwise -- greatly attenuates this reverse causation.
15. We have found in other work, for example, (Mitchell, Cromwell, and Schurman, 1981), that physicians with large Medicaid practices use significantly more clerical personnel, essentially adapting to the difficulties usually associated with reimbursement.
16. Davidson and Perloff (1980) have recent, unpublished, results on the impact of Medicaid fee generosity on Medicaid participation of pediatricians but not on the origins of why states vary in their generosity to begin with.
17. A 0,1 dummy just for the presence or absence of the optional program was also quite significant, but not as significant as the continuous specification, implying that once a state offers a medically needy program, its service scope still has a positive impact on utilization.
18. Only 36 percent of D.C. households report both husband and wife, by far the lowest percentage in the U.S. California and New York, at 59 percent, are more typical with states like Oklahoma (65%) at the upper end. D.C. also has very few elderly (10.3%) compared to, say, Oklahoma (12.4%) or Florida (17.1%), (1978 Statistical Abstract)
19. See footnote 12 above. Dropping either POVP or STINC only guarantees that FMAP's coefficient will be negative, as it now reflects the state's tax base (inversely) as well as the cost-sharing effect.

20. Several of the FMAP coefficients in other coverage equations were the right sign, but never significant.
21. Delaware, Maryland, and Washington, D.C. are all considered southern states by the Census Bureau, yet all are wealthy states. Delaware, however, has no medically needy program, and both Delaware and Maryland have lower than average RECPOV ratios. Thus, putting them into the Northeast region may not have a great effect on our results.

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